SNOW SAMPLING SURVEY
in the vicinity of
MACMILLAN BLOEDEL BUILDING MATERIALS LIMITED
THUNDER BAY

February, 1980

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INTRODUCTION

A snow sampling survey carried out in January, 1979, showed that conductivity, suspended solids, total carbon, and pH levels were elevated in snow in the vicinity of a waferboard plant located near Rosslyn Village, 15 km (kilometres) west of Thunder Bay (1). These parameters were selected as indicators of fallout of particulate matter from the plant's wood waste burner.

In mid-March, 1979, operation of the conical wood waste burner was terminated. The wood waste is now sold to other forest products industries, with a small percentage incinerated in an "Energex" system at MacMillan Bloedel's Rosslyn plant.

To determine if these process changes achieved a reduction in particulate emissions, a second snow survey near the waferboard plant was conducted in February, 1980.

METHOD

Duplicate samples of snow were collected on February 18, 1980 from 15 sites near MacMillan Bloedel (Figure 1) and from two control locations remote from the study area. Sample collection and processing methods were the same as those described in the 1979 survey (1). Snow samples were submitted for conductivity, suspended solids, carbon, and pH determinations. Carbon analyses were performed at the Ministry's Toronto laboratory, and the other tests were conducted at the Ministry's Thunder Bay laboratory.

RESULTS AND DISCUSSIONS

Snow meltwater results are presented in Table 1, with comparable results from the 1979 survey. Total carbon, suspended solids, sample conductivity, and pH all decreased in 1980 compared to 1979, especially in residential areas in the vicinity of

the waferboard plant, although levels still exceeded those recorded at control sites. Levels of all contaminants decreased with increasing distance from the waferboard plant. The distribution pattern for total carbon, in Figure 2, was similar to that for all contaminants and pH. The close correlation between carbon and suspended solids, noted in both 1979 and 1980 (Figure 3), showed that suspended solids in snow meltwater were composed almost entirely of carbon.

Trace to heavy quantities of wood fines were noted on or below the snow surfaces at sites 1, 2, 3, 4, 5, and 7. Unlike the previous year, no sawdust, bark, or wood char was observed near the MacMillan Bloedel facility. Snow cover depth averaged 44 cm (centimetres) and ranged from 32 to 58 cm.

The reduction in suspended solids, carbon, and conductivity documented by this study shows that the abatement program implemented by MacMillan Bloedel was largely successful. Although the survey indicated that there was still some fallout of wood fines, the area of deposition was restricted mainly to company property. This improvement has resolved a local nuisance problem, and no complaints have been received from area residents since the abatement program was implemented. No further controls of emissions from this facility are being considered at present.

ACKNOWLEDGEMENTS

We wish to thank staff of the Industrial Abatement Section, Thunder Bay District Office, for assistance in collecting snow samples.

REFERENCE

1. Racette, D. J. and H. D. Griffin. 1979. Snow sampling survey in the vicinity of MacMillan Bloedel-Laidlaw Lumber Company Limited, Thunder Bay, January, 1979. Ontario Ministry of the Environment.

TABLE 1. Conductivity, suspended solids, total carbon, and pH levels in snow meltwater in the vicinity of MacMillan Bloedel, January 15, 1979 and February 18, 1980.

Station	Conductivity µmhos/cm		Suspended solids mg/l		Total carbon mg/l		pH	
	1979	1980	1979	1980	1979	1980	1979	1980
1	76	44	380	850	200	170	9.8	7.0
2	200	64	340	360	220	120	10.8	9.5
3	30	16	15	22	10	13	8.8	5.9
4	42	30	120	300	70	120	8.9	6.1
5	29	18	40	100	19	32	7.8	4.8
6	140	16	280	65	160	37	10.6	5.7
7	50	16	42	68	27	8	8.2	5.3
8	26	20	28	25	8	7	7.1	4.8
9	32	14	35	22	13	9	8.3	5.0
10	60	18	90	25	41	9	9.8	5.2
11	32	15	18	10	7	4	6.5	4.8
12	-	16	-	20	-	11	-	4.8
13	-	24	-	22	-	10	-	4.8
14	-	19	-	10	-	6	-	4.9
15	-	28	-	58	-	10	-	5.3
Controls	35	39	10	15	4	8	4.9	5.3

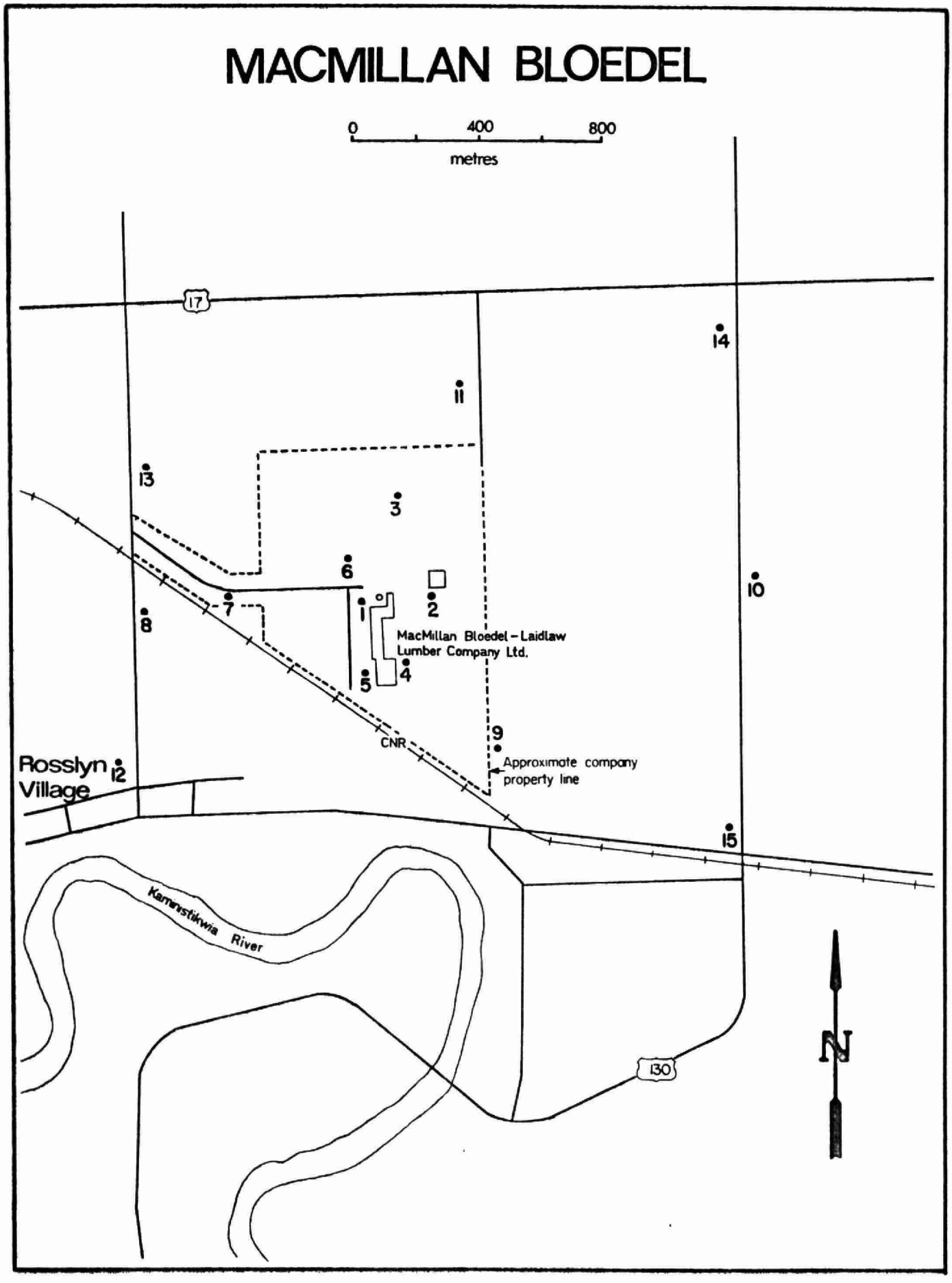

Figure 1. Snow sampling sites, February 18, 1980.

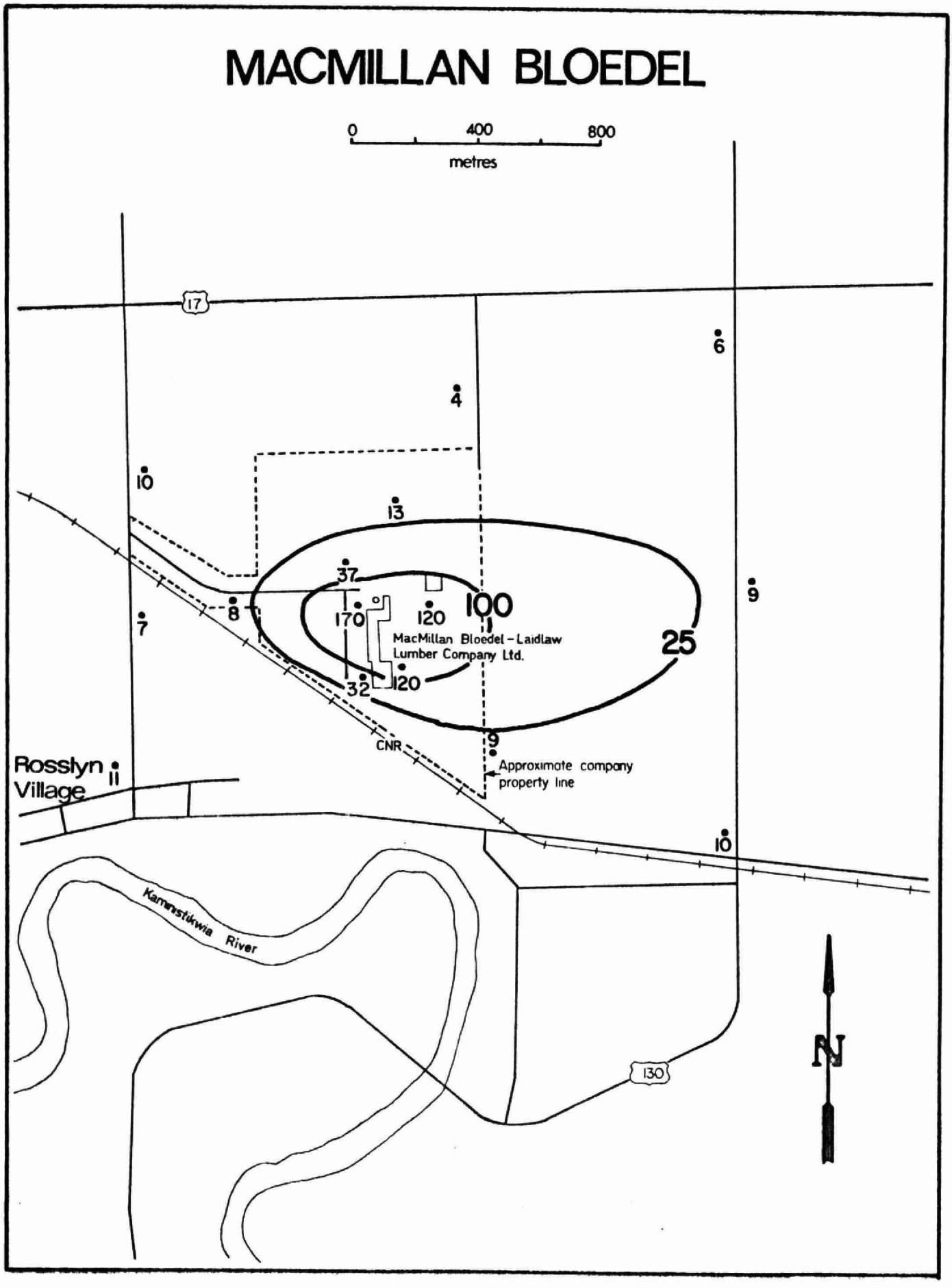

Figure 2. Total carbon (mg/l) levels in snow, February, 1980.

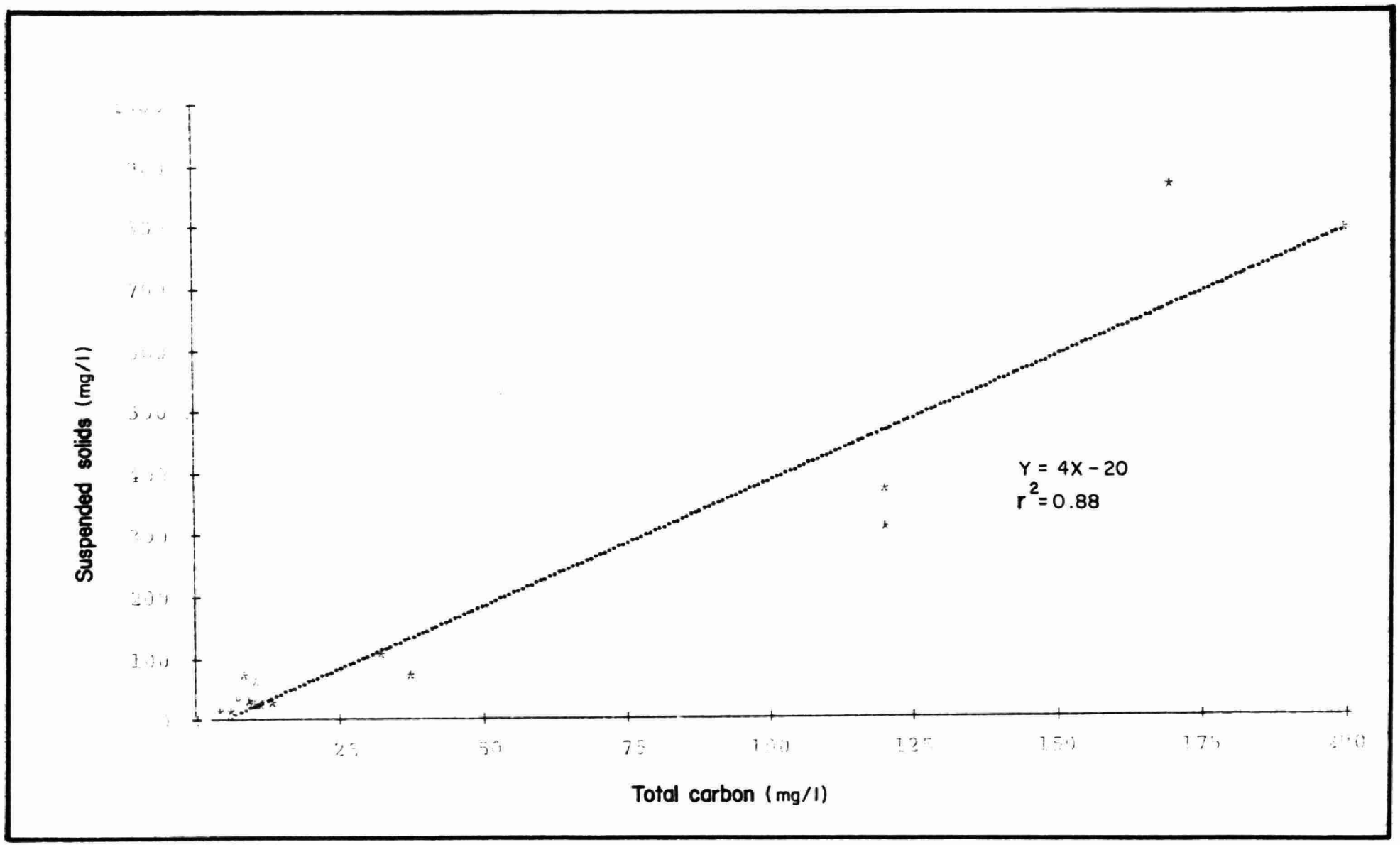

Figure 3. Linear regression of suspended solids and total carbon in snow, February 18, 1980.

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